DDS&T-1236-70
6 April 1970

MEMORANDUM FOR: Executive Director-Comptroller

THROUGH : Deputy Director for Science and Technology

SUBJECT : Acquisition of a [redacted] Computer Communications System

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1. This memorandum contains a recommendation in paragraph 10 for your approval.

2. Background. OCS has been expanding time-sharing activities over the past two years in order to satisfy a growing number of applications which require this class of computer processing. There were two keyboard-type terminals operating in 1968; 50 are now installed. A recent survey indicates that OCS and its customers have plans for over 200 terminals by the end of FY-72. The need for another class of terminal operation is emerging as well: devices in user areas for reading cards and printing at medium speeds. Such devices are installed now in OSP and FMSAC and connected to OCS computers. Still another class of computer connection will be needed soon, where a computer itself (either inside the computer center or outside) will be connected as a terminal device.

3. Apart from the comparatively simple problems of installing these three classes of terminal devices and running data transmission lines to the computer center, there is the much more complex problem of designing computer software and developing the computer system to support the customer's use of these terminals. This means that computer software must be developed to handle various control functions, transmission speeds, and data coding schemes which are peculiar to each terminal device. Similarly, each terminal device is physically connected to the computer through a buffering or control unit peculiar

to the needs of that terminal. Seven types and models of terminals are in use today; 15 types are projected by FY-72. As more terminals and differing types of terminals are added to the computer system, the number of control units increases, the system software becomes more complex, and service to the customer tends to degrade.

4. Objectives. The above developments point to four design objectives which must be met if OCS is to provide effective service:

a. Time-sharing software must be simplified and held to minimum size so that the system "overhead" caused by communication peculiarities does not degrade the responsiveness of the time-sharing system to unacceptable levels. The central computer must be freed from communication tasks to do more of the work for which it is intended.

b. Physical and electrical aspects of connecting all three classes of terminals with both batch and time-sharing computers must be simplified.

c. Flexibility must be provided so that additional terminals can be added without requiring major reprogramming in system software.

d. There must be some provision for data transfer between computers within our Center so that both the batch and interactive service requirements of a given job can be handled by the computer appropriate to each kind of service.

Experience to date clearly indicates that the present method of configuring computer systems for terminals will not permit these design objectives to be met. I believe the solution lies in the application of so-called communications processors--computers which absorb several communications housekeeping functions normally assigned to the central computer or its various control units.

5. Discussion. A communications processor in OCS would be used as a device for standardizing our methodology for connecting the three basic classes of terminals (keyboard terminals, remote readers/printers, and other computers) to our processors. It would be capable of performing the following kinds of functions, for example:

--Translating internal computer data to correct terminal codes and vice versa.

--Selecting the correct transmission speeds.

--Providing correct control codes for synchronizing the terminal to the computer, determining what type of data is being transmitted, etc.

--Providing temporary storage to hold terminal data until the computer is ready to accept it.

--Accumulating system usage statistics.

These functions (and the communication processor itself) have no direct impact on SIDES plans; our objective relates to a re-orientation of tasks normally assigned to OCS computers and associated peripheral units.

6. An analysis has been made of communications processors offered by Honeywell, IBM, Univac, Computer Communications Incorporated, InterData, Sanders Associates, and COMCET, Inc. Our evaluation of these communications processors indicates that the [redacted] Computer Communications System offers the best answer to our design objectives from the standpoint of capability for meeting current needs, expansibility to future needs, and minimum impact on the size and complexity of software.

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7. The [redacted] equipment will cost [redacted] to purchase and $15,288 in annual maintenance (see attachment). Procurement of this equipment would permit release of some rented IBM peripheral devices with a purchase value of about [redacted] and would avoid additional procurement of such devices for an additional savings over the next three years--in purchase terms of about [redacted] Thus, there is also a clear, long-range cost advantage in using the [redacted] technology. Procurement at this time will enable OCS to install this equipment in May 1970 and to test the new system before computer terminal installations reach critical proportions. OCS has sufficient FY-70 purchase funds to obligate for the procurement action. This proposal has been coordinated with the Office of Communications. In addition, the Information Processing Staff and the DDI ASPIN Staff have been briefed on this action.

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8. Alternatives. There are two realistic alternatives to this procurement, both concerned with deferral:

(a) First, we could continue with our present techniques which use special purpose, hard-wired control units and allocate communication tasks to the central computers. However, each new user requirement will increase the complexity of our operations. I estimate that we will not be able to hold off the procurement of [redacted] like equipment for more than a year without creating severe problems.

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(b) Secondly, close management control could be applied to requests for terminal facilities, reducing somewhat the need for a communications processor, or at least delaying it. With our already heavy commitment, a virtual moratorium on additional terminals would have to be applied to delay this procurement significantly.

9. Risks. The principal risks in pursuing the communications processor concept are:

a. Security. If pursued vigorously, the implementation of the communications processor concept would eventually provide for all data moved into and out of the computer center electrically to go through such a device. This "funneling" raises the question of whether data can be accidentally intermixed. The safeguards now being used for data in our central processors and its peripheral devices will be applied in the communications processor as well. This is not a new security problem; it is another manifestation of one we already have. But it may add another factor of concern to Security people (in the same way that increasing processing volume increases compromise possibilities).

b. Reliability. Again, because the communications processor would be the focal point in our internal data network, high reliability is paramount. The manufacturer recognizes this: the device has been designed with stringent reliability specifications. Further, we would expect to acquire another [redacted] device when our processing and reliability requirements demand it; a dual system will improve overall reliability.

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c. Disruptive effects on our operations. While limited testing of the communications processor and its software can be performed offline, testing of the overall system will require us to put the device into everyday operation. This could result in temporary outages for the terminal users. We hope to minimize these effects by an incremental approach to implementation, judicious scheduling of testing periods, and careful development procedures. This may increase the time for development and delay the real payoff, but caution in this regard is vital.

d. Precedent Setting. The communications processor concept has validity for other computer centers in the Agency as well as OCS. As their requirements change, the possibility of their acquisition of such devices may arise and OCS experience [redacted] will be reviewed. Since this particular equipment seems to be the most flexible on the market, I would suspect that it would meet the needs of other Agency centers. On the other hand, other devices (perhaps incompatible) having less capability at lower cost may be sufficient in some cases. 25X1A

e. Standardization. If improperly managed, the number of types of terminal devices could proliferate because the communications processor will make it easier to connect new kinds of terminals. This is not our intent. We share OC's concern for reducing the variety of terminal devices to the few that are really needed.

10. I recommend that you approve the acquisition of the [redacted] 25X1A
25X1A [redacted] Computer Communications System at the purchase price of [redacted] 25X1

[redacted] 25X1A

Acting Director of Computer Services

Attachment

25X1A [redacted] Specifications

COORDINATED WITH THE OFFICE OF COMMUNICATIONS:

25X1A [redacted]

Director of Communications Date

DDS&T-1236-70
6 April 1970

25X1A Subject: Acquisition of a [redacted] Computer Communications System

CONCUR:

25X1 [redacted] 9 APR 1970

Deputy Director for Science and Technology — Date

APPROVED:

Executive Director-Comptroller — Date

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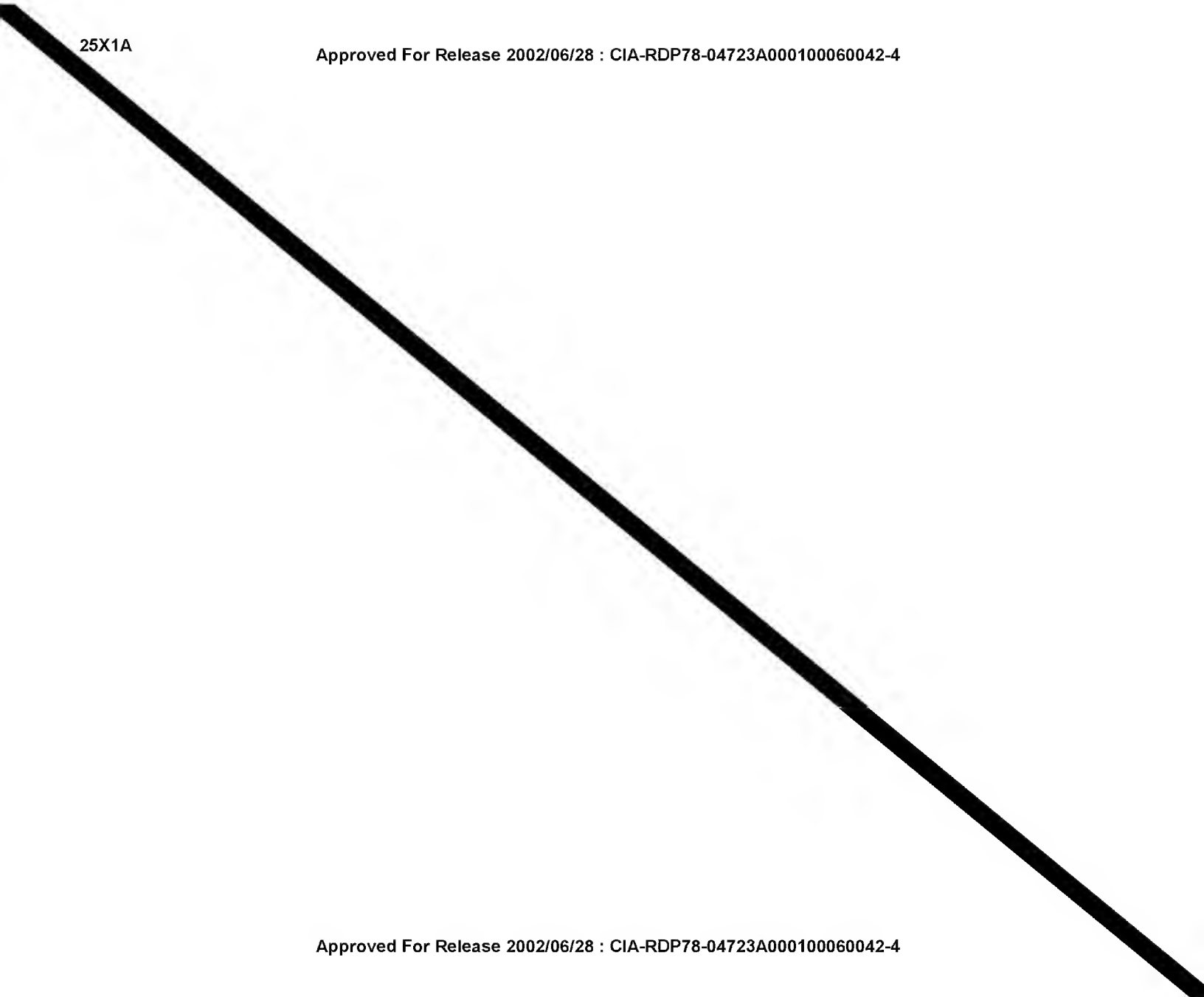

Approved For Release 2002/06/28 : CIA-RDP78-04723A000100060042-4

Extract from Memorandum for the File, Subject, "OCS Proposal to Acquire 25X1A [redacted] Communications Processor Computer," dated 13 April 1970 and signed by [redacted] C/IPB/OS: 25X1A

"The case made for utilizing communications processors such as 25X1A the [redacted] appears to the undersigned to be irrefutable from a practical standpoint. Obviously the problem of great numbers of terminals being tied into OCS systems needs attention, and the attachment suggests 25X1A strongly that the [redacted] or a similar processor is the answer. 25X1A

"The security aspects to the acquisition and installation of the [redacted] appear to be the following:

a. Substitution of a software control mechanism for a hard-wired piece of equipment generally would provide a lesser degree of security in the routing of classified data;

b. As stated in paragraph 9a of the attachment, the "funneling" of all data moving in and out of various computer systems through such a device increases the possibility of accidental intermingling and spillage;

c. As long as all systems tied together through the [redacted] 25X1A are controlled at the Top Secret level, and are limited to terminals manned by CIA personnel, the additional risk of spillage in the opinion of the undersigned would be acceptable. This opinion is based on the presumption that the network so created is limited to two or three OCS systems, all of which have the basic security safeguards currently available in the OCS IBM 360/67;

d. As noted somewhat in paragraph 9a, increasing the processing volume, the quantity of data in such a network and the number of people having potential access to such data increases compromise possibilities. Utilization of the communications processor, therefore, suggests that system security features be enhanced proportionately.

"This memorandum.....should not be interpreted as an official OS concurrence or coordination to the attached proposal."

25X1A

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25X1A Acquisition of a [redacted] Computer Communications System

Acting Director of Computer Services
[redacted] Hqs

[redacted]

DDS&T #1236-70

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DATE 6 April 1970

Office designation, room number, and building	Date	Officer's initials	COMMENTS (Number each comment to show from whom. Draw a line across column after each comment.)
1. D/OC CIA/3, Hqs			OC offers no objection to the procurement proposed. While longer term planning for data distribution is not finalized, this computer should be compatible with the final configuration. R.A.B.
2. DDS&T 6E43, Hqs	7 APR 70		OS has reviewed this proposal. A summary of OS comments are attached. [redacted] 25X1A
3. Exec. Dir-Compt. 7D 3, Hqs	8/4		
4. AD/OCS 2D29, Hqs			
5.			